

SET -3(SOLUTION)

SCIENCE

TIME: 3 HRS.

MAX. MARKS: 80

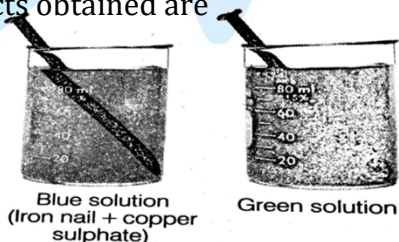
General Instructions:

1. This question paper consists of 39 questions in 5 sections.
2. All questions are compulsory. However, an internal choice is provided in some questions. Student are expected to attempt only one of these questions.
3. **Section A** consists of 16 objective type questions carrying 1 mark each. Q. No. 17 to 20 are Assertion-Reason based questions.
4. **Section B** consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should be in the range of 30 to 50 words.
5. **Section C** consists of 7 Short Answer type questions carrying 03 marks each. Answer to these questions should be in the range of 50 to 80 words.
6. **Section D** consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.
7. **Section E** consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

SECTION A

Select and write the most appropriate option out of the four options given for each of the questions 1-20.

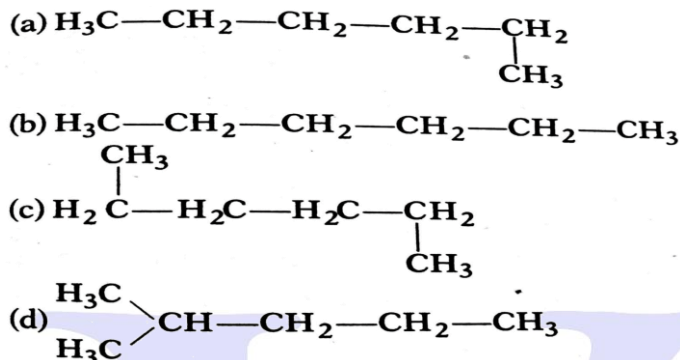
1. The given experiment shows the reaction between iron nail and copper sulphate. It produces a green color solution. The products obtained are



- (a) Ferric sulphate, copper
(b) Cuprous sulphate, iron
(c) Iron sulphate, cupric sulphate
(d) **Ferrous sulphate, copper**
2. _____ is a basic salt because it is a salt of weak acid and strong base.
(a) Sodium bicarbonate
(b) **Sodium carbonate**
(c) Sodium hydroxide
(d) Sodium chloride
3. Galvanisation is a method of protecting iron from rusting by coating it with a thin layer of
(a) Gallium (b) aluminum
(c) **zinc** (d) silver
4. Select the acid which contains four hydrogen atoms in it.
(a) Formic acid (b) Sulphuric acid
(c) Nitric acid (d) **Acetic acid**
5. Puja studied about the metals. She came to know about its many properties. Which of the following is a characteristic of metals?
(a) **They have one to three valence electrons**
(b) They have 4 to 8 valence electrons.
(c) They are brittle.
(d) They are capable of forming anions easily.
6. Which of the following is the mineral acid?
(a) **Hydrochloric acid** (b) Citric acid

- (c) Acetic acid (d) Lactic acid

7. Which of the following is not a straight chain hydrocarbon? **(Answer-D)**



8. In a food chain, the snake predated a rabbit which fed on fresh green bushes. What percentage amount of the energy accumulated by rabbit, would be acquired by snakes?

- (a) 90 % **(b) 10%**
(c) 50% (d) 25%

9. Energy in case of higher plants and animals is obtained by

- (a) Breathing **(b) tissue respiration**
(c) Organ respiration (d) digestion of food

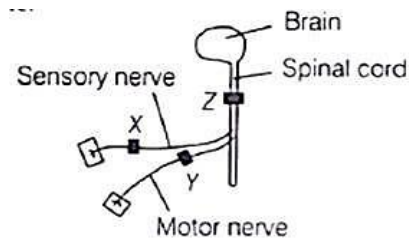
10. In human males, all the chromosomes are paired perfectly, except one. These unpaired chromosomes are:

- (i) Large chromosome (ii) small chromosome
(iii) Y-chromosome (iv) X-chromosome

Which of the following options is correct regarding the same?

- (a) (i) and (ii) **(b) (iii) and (iv)**
(c) (iii) only (d) (ii) and (iv)

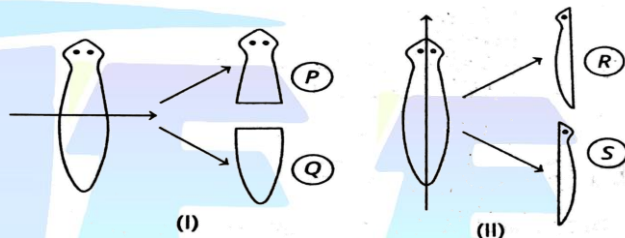
11. The diagram shows the central nervous system, which has been blocked in three different places by a drug used as an anaesthetic.



Three men had one anesthetic block at X, Y and Z respectively. One of the man can move his leg in response to a pinprick, but he doesn't feel it. Where is the anesthetic block in this man?

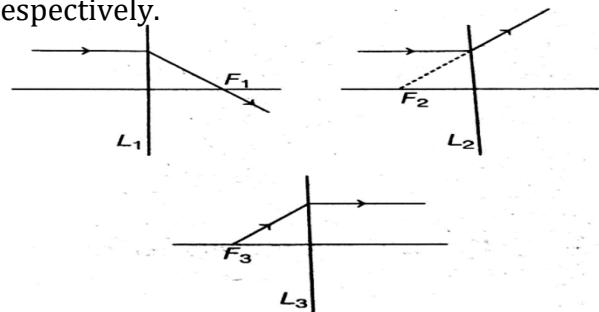
- (a) At X (b) At Y
(c) At Z (d) No block

12. A Planaria worm is cut horizontally from the middle into two halves P and Q. Another Planaria worm is cut vertically into two halves R and S. Which of the cut pieces of the two Planaria worms could regenerate to form the complete worm?



- (a) Only P (b) R and S
(c) P and Q **(d) P, Q, R and S**

13. The following figures show the path of light rays through three lenses marked L_1 , L_2 and L_3 and their focal points F_1 , F_2 and F_3 , respectively.



Out of L_1 , L_2 and L_3 concave lens/lenses is/are

- (a) Only L_1 **(b) only L_2**
(c) only L_3 (d) Both L_1 and L_3

14. The size of the pupil of the eye is adjusted by
(a) cornea (b) retina
(c) iris (d) blind spot

15. Which statement is true for a dominant allele?

- (a) It cannot undergo mutation.
(b) It gives a greater chance of survival than a recessive allele.
(c) It gives the same phenotype in heterozygotes and homozygotes
(d) It is only responsible for male characteristics

16. Which amongst the listed tools was used to study the law of inheritance in pea plant by Gregor Johann Mendel?

- (a) Family tree (b) Pedigree tree
(c) Punnett square (d) Herbarium sheet

Directions (Q.Nos.17-20) consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

- (a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.

- (c) A is true but R is false.
(d) A is false, but R is true.

17. **Assertion (A):** Carbon and its compounds are used as fuel for most applications.

Reason (R): On combustion of carbon, a large amount of heat and light is released.

(Answer-A)

18. **Assertion (A):** Lymph also known as tissue which is colourless.

Reason (R): It lacks erythrocytes.

(Answer-A)

19. **Assertion (A):** Fertilisation is a unique feature in flowers.

Reason (R): It is followed by pollination.

(Answer-C)

20. **Assertion (A):** A current-carrying solenoid, always comes to rest in geographical N-S direction, when suspended freely.

Reason (R): One end of current carrying straight solenoid behaves as a North-pole and the other end as a South-pole, just like a bar magnet.

(Answer-A)

SECTION B

Question No. 21 to 26 are very short answer questions.

21. Discuss about the nature of covalent bond.

Sol. Carbon has 4 electrons in its valence shell. To complete its octet, it either needs to gain 4 electrons or lose 4 electrons to the other atom. Both these processes are impossible. Therefore, carbon atom achieve noble gas configuration by sharing 4 electrons with other atoms of itself or atoms of other elements.

The bonds that are formed by sharing electrons are known as **covalent bond**. In covalent bonding, both atoms share the valence electrons, i.e. the shared electrons belong to the valence shell of both the atoms.

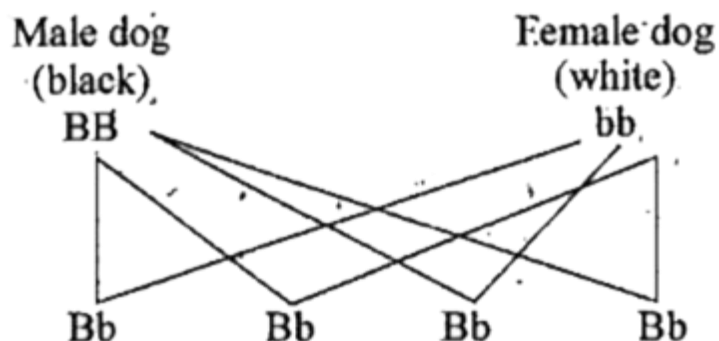
CH_3Cl is called chloromethane, which contains 1 carbon atom, 3 hydrogen atoms and 1 chlorine atom.

(1)

22. Outline a project, which aims to find the dominant coat color in dogs.

Sol. Select a homozygous black (BB) male dog and homozygous white (bb) female dog and cross-

breed them. The resultant offspring (F_1 -generation) will be



If all the offsprings of the F_1 -generation are black, we can conclude that black colour is dominant over white coat colour in dogs and if all the offspring are white, the dominant colour will be white. (1)

23. Difference between exocrine and endocrine gland.

Or

What is reflex arc? How do muscle cells move?

Sol. Differences between exocrine gland and endocrine gland are as follows

Exocrine gland	Endocrine gland
It does not pour secretion into lymph or blood.	It pours its secretion into lymph or venous blood.
A duct of often present	The glands are without ducts or are ductless.
The secretion is poured directly over the target tissue.	The secretion is transported to target tissue through blood.
The secretion is enzymatic, lubricant or excretory.	The secretion contains hormones.
Example Sweat glands, lacrimal glands, salivary glands, mammary glands etc.	Example Pituitary gland, thyroid gland and adrenal gland.

Or

The pathway taken by nerve impulse in a reflex action is called the reflex arc. They allow rapid response to a stimulus, e.g. pulling of hand on touching a hot object.

Muscle cells have special proteins that change their shape and arrangement in the cell in response to electric impulse. This forces the muscle cells to contract and relax, causing their movement. (1)

24. The refractive indices of three media are given below.

Medium	Refractive Index
A	1.6
B	1.8
C	1.5

A ray of light is travelling from A to B and another ray is travelling from B to C.

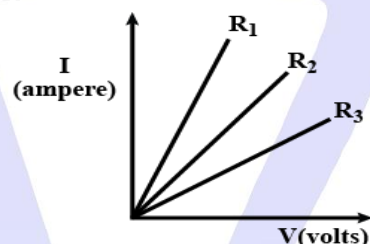
(a) In which of the two cases the refracted ray bends towards the normal?

(b) In which case does the speed of light increase in the second medium? Give reasons for your answer.

Sol.- (a) When light travels from an optically rarer medium to an optically denser medium it moves towards the normal. Then, $n_B > n_A$.

The light ray will increase when the light travels from B to C, since $n_C < n_B$ and $v = (c/n)$, the speed of light ray will increase in the second medium. (1)

25. A student carries out an experiment and plots the V-I graph of three samples of Nichrome wire with resistances R_1 , R_2 and R_3 , respectively as shown in figure. Interpret the graph by considering R_1 , R_2 and R_3 in proper order.

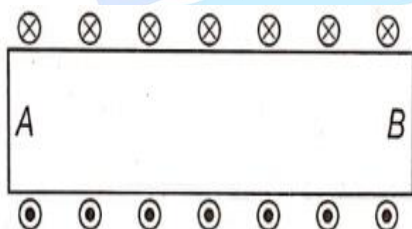


Or,

Diagram shows the lengthwise section of a current carrying solenoid.

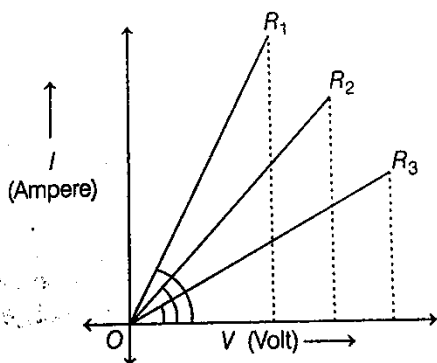
⊗ Indicates current entering into the page,

⊙ Indicates current emerging out of the page.



Decide which end of the solenoid A or B, will behave as North Pole. Give reason for your answer. Also, draw field lines inside the solenoid.

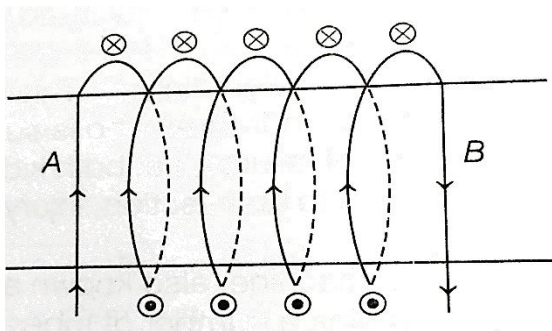
Sol.- As we know that, slope of V-I graph tells about the resistance and $(\text{slope of } V \text{ and } I) \propto \frac{1}{\text{resistance}}$, i.e



So, $R_3 > R_2 > R_1$

From diagram, we can see that current is entering from A and emerging out from B.

(2)



Thus, using right hand thumb rule, direction of magnetic field lines is from *B to A*. We know that, magnetic field lines move from North to south direction.

Thus, B represents North pole or A represents South pole.

(1)

26. (a) Describe the role of Fallopian tubes in the female reproductive system.

(b) Defines placenta.

Sol.- (a) Fertilisation North pole or A represents South Fallopian tubes. It act as site of Fertilisation in human female.

(1)

(b) The placenta is an organ that develops in the uterus during pregnancy. It provide oxygen and nutrients from mother. It also removes waste produced from the baby.

(1)

SECTION C

Question No. 27 to 33 are short answer questions.

27. Cheshta, a 10th class student was asked to identify iron, copper, zinc and aluminum only by observing the effect of action of concentrated nitric acid and caustic soda on each metal. How did she put the reactions of these metals with each of the reagents?

Or

Compound 'X' and aluminum are used to join railway tracks. Identify the compound 'X' and name the reaction. Write the equation for it.

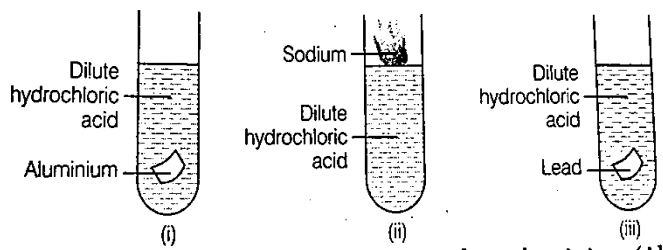
Sol.-

Action of Concentrated Nitric Acid	Action of Caustic Alkali	Inference
No characteristic change	No characteristic change	Iron
Liberates brown coloured NO_2 gas	No characteristic change	Copper
Liberates brown coloured NO_2 gas	Liberates hydrogen gas	Zinc
No characteristic	Liberates hydrogen gas	Aluminium

Or

- X is Fe_2O_3 , i.e. iron (III) oxide
- The reaction involved is thermite reaction or aluminothermy.
- $Fe_2O_3(s) + 2Al(s) \rightarrow Al_2O_3(s) + Fe(l) + Heat$
 Ferric oxide Aluminium Aluminium oxide Iron

28. During the reaction of some metals with dilute hydrochloric acid, following observations were made.

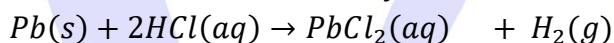


- The temperature of the reaction mixture rises when aluminum (Al) is added.
- The reaction of sodium metal is found to be highly explosive.
- Some bubbles of a gas are seen when lead (Pb) is reacted with the acid. Explain these observations with suitable reasons.

Sol.- (a) The temperature of the reaction mixture rises when aluminium is added because it is an exothermic reaction and thus, heat gets liberated in these reactions. (1)

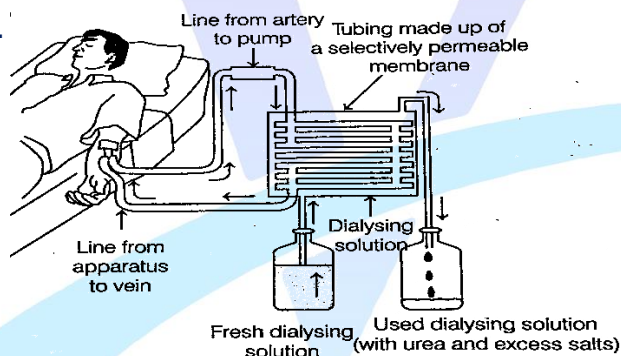
(b) Reaction of sodium metal is found to be highly explosive because it is an exothermic reactions. (1)

(c) When lead is treated with hydrochloric acid, bubbles of hydrogen gas are evolved.



Lead Lead chloride (1)

29.



(a) Identify the process taking place in the above diagram. When does this process become essential for an individual?

(b) Describe the above process in detail.

Sol.- (a) The process is called dialysis. This process is essential for an individual who is suffering from complete renal failures, i.e. both kidneys are damaged due to an infection, injury, high BP, etc.

(b) The dialysis machine, also known as artificial kidney, contains a number of tubes with a semipermeable lining suspended in a tank

30. 'In humans, there is a 50% probability that a boy will be born and 50% probability that a girl will be born'. Justify the statement on the basis of the mechanism of sex-determination in human beings.

Sol.- All children will inherit an X-chromosome from their mother regardless of whether he is a boy or girl.

Thus, the sex of the child will be determined by what they inherit from their father. A child who inherits an X-Chromosome from her father will be a girl and one who inherits a Y-chromosome will be a boy.

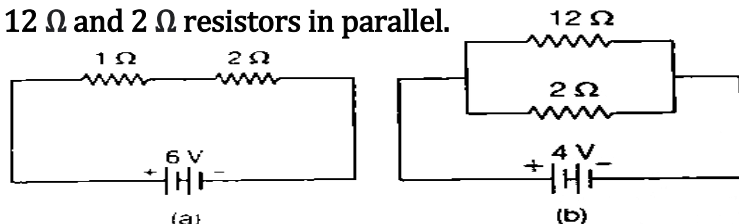
Humans have 23 pairs of chromosome will be a boy.

Male (XY) has one X and one Y sex-chromosome Female (XX) has both X sex chromosome. (3)

31. The diagram shown below is connection of

(a) $1\ \Omega$ and $2\ \Omega$ resistors in series.

(b) $12\ \Omega$ and $2\ \Omega$ resistors in parallel.



Compare the power used in $2\ \Omega$ resistors in each of the following circuits.

(a) A 6 V battery in series with $1\ \Omega$ and $2\ \Omega$ resistors.

(b) A 4 V battery in parallel with $12\ \Omega$ and $2\ \Omega$ resistors.

Sol:- (a) The circuit is shown in left;

Resistances are connected in series combination.

$$\text{Current in the circuit, } I = \frac{V}{R_1 + R_2} = \frac{6}{3} = 2A$$

$$\therefore \text{Power used} = I^2 R = (2)^2 \times 2 \\ = 2 \times 2 \times 2 = 8W$$

(1)

(b) The circuit is shown in right,

In parallel combination, potential across each resistor is same and equal to the potential applied to the circuit.

Potential across $2\ \Omega$ resistor, $V = 4V$

$$\text{Power used} = \frac{V^2}{R} = \frac{4 \times 4}{2} = 8W$$

Power used in both the cases is same.

(2)

32. An object of height 5 cm is placed on the principal axis of concave mirror of focal length 20 cm. If the virtual image is formed by the concave mirror at a distance of 10 cm from its pole, then find

(a) the size of the image.

(b) magnification produced by the mirror.

Sol:- (a) Given, height of an object, $h_1 = 5\text{ cm}$,

$f = -20\text{ cm}$ and $v = 10\text{ cm}$

Using mirror formula, $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$

$$\Rightarrow \frac{1}{u} = \frac{1}{f} - \frac{1}{v} = \frac{1}{-20} - \frac{1}{10} = \frac{-3}{20}$$

$$\Rightarrow u = -\frac{20}{3}\text{ cm}$$

Since, magnetic, $m = \frac{h_2}{h_1} = \frac{-v}{u}$

$$\Rightarrow h_2 = \frac{-v}{u} \times h_1 = -\frac{10}{\left(-\frac{20}{3}\right)} \times 5 = \frac{15}{2} = 7.5\text{ cm}$$

Alternate Solution

Given, height of an object, $h_1 = 5\text{ cm}$, $f = -20\text{ cm}$ and $v = 10\text{ cm}$

Linear magnification of concave mirror, $m = \frac{f-v}{f}$

$$\frac{h_2}{h_1} = \frac{f-v}{f} \quad [\text{where, } h_2 = \text{height of image}]$$

$$h_2 = \frac{f-v}{f} h_1 = \frac{-20-10}{-20} \times 5$$

$$= \frac{3}{5} \times 5 = 7.5 \text{ cm}$$

$$(b) \text{ Magnification, } (m) = \frac{-v}{u} = \frac{-10}{\left(-\frac{20}{3}\right)} = \frac{3}{2} = 1.5 \quad (1)$$

33. State whether an α -particle will experience any force in a magnetic field, if (α -particles are positively charged particles)

(a) It is placed in the field at rest.

(b) it moves in the magnetic field parallel to field lines.

(c) it moves in the magnetic field perpendicular to field lines. Justify your answer in each case.

Sol.- (a) No, it will not experience any force. As, magnetic field, exerts force on an moving charged particle only. (1)

(b) No, it will not experience any force because magnetic field exerts a force in perpendicular direction to motion of the particle.

(c) Yes, it will experience a force in a direction perpendicular to the direction of its own motion and the direction of magnetic field can be determined by Fleming's left hand rule.

SECTION D

Question No. 34 to 36 are long answer questions.

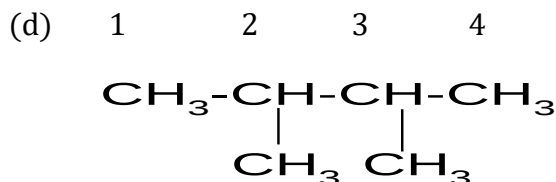
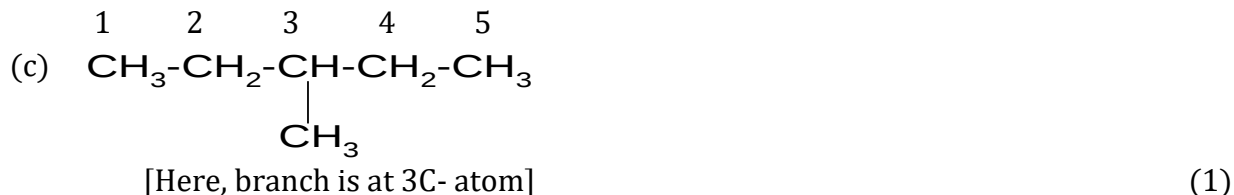
34. Kamini was studying about the compound C_6H_{14} . She wondered about its different structure with same formula. Give the name of the compound. Also write the structural formulae of all the isomers of an alkane with six C-atoms (C_6H_{14}).

Or

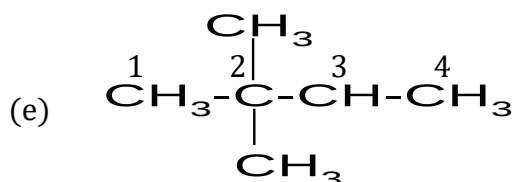
(a) Calcium on reacting with water starts floating. Give the reason behind this and write the balanced chemical equation of the reaction.

(b) Rashmi was studying about CH_3Cl compound. Show the bond formation in this compound.

Sol. The name of compound is hexane and it has the following five isomers.



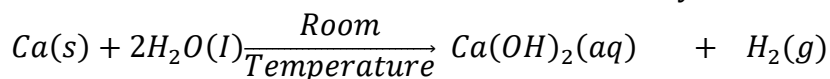
[Here, branches are at C-2 and C-3 atoms] (1)



[Here, branches are at C-2 carbon atom only] (1)

Or

(a) Calcium reacts with cold water to form calcium hydroxide and hydrogen gas. (2)



Calcium hydroxide

The bubble of hydrogen gas produced stick to the surface of calcium and hence, it starts floating on the surface of water

K L

(b) Electronic configuration of carbon, 6 = 2, 4

K

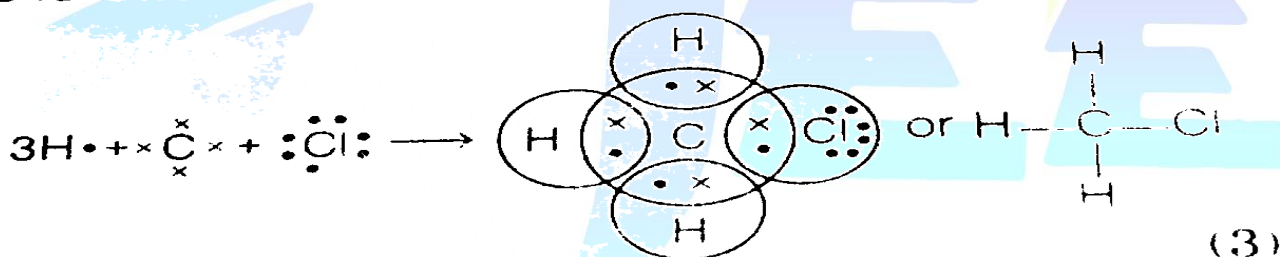
Electronic configuration of hydrogen, 1 = 1

K L M

Electron configuration of chlorine, 17 = 2, 8, 7

Carbon atom has four outermost electrons, each hydrogen atom has one electron and chlorine has seven outermost electrons.

Carbon shares its four outermost electrons with 3 hydrogen atoms and 1 chlorine atom to form CH_3Cl as follows



35. Differentiate between the following.

- Pollen tube and style
- Fission in Amoeba and Plasmodium
- Fragmentation and regeneration
- Bud of Hydra and Bryophyllum
- Vegetative propagation and spore formation

Or

- Hormones are needed by our body in an appropriate amount, slightly more or less secretion causes disorders in our body. Illustrate this by using three examples.
- Why do we call pituitary gland as the master gland? Where is it located?

Sol.- (a) Differences between pollen tube and style are

Pollen Tube	Style
A tube growing out of pollen grain when it reaches stigma.	The middle elongated part of the carpel, i.e. female part of a flower.
It transports male gametes from pollen grains to ovules	The attachment of stigma to the ovary.

(1)

(b) Fission in Amoeba is binary and in Plasmodium is multiple. The difference in

Binary Fission	Multiple Fission
The parental body divides into two identical daughter cells at a time	The parental body divides into numerous daughter cells simultaneously.

(1)

(c) Difference between fragmentation and regeneration is

Fragmentation	Regeneration
The method in which multicellular organism breaks up into two or more fragments.	The growth of a whole new organism from any of its body part, i.e. single segment forming new individual.

(1)

(d) Difference between bud of Hydra and Bryophyllum is

Bud of Hydra	Bud of Bryophyllum
It is seen during budding as an outgrowth on the body of Hydra, which gets fully grown and then detaches from the body and becomes a new individual.	It is present on the leaf margins of leaf of Bryophyllum and develop into a new plant when it comes in contact with soil and other favourable conditions.

(1)

(e) Difference between vegetative propagation and spore formation is

Vegetative Propagation	Spore Formation
New plants are obtained from different parts of parent body like leaves, stems, etc.	Spore when fall on land, have the ability to germinate and produce new fungal colonies under favourable conditions.

(1)

Or

(a) Hypersecretion (more secretion) or hyposecretion (less secretion) of different hormones lead to various disorders in our body. The three common examples are

(i) **Goitre** Iodine acts as the necessary component for the synthesis of thyroxine hormone from thyroid gland. This disorder is caused due to the deficiency of iodine that leads to hyposecretion of thyroxine

(ii) **Gigantism** and dwarfism Hypersecretion of growth hormone results in gigantism (very tall individual)

On the contrary, the hyposecretion or deficiency of growth hormone at an early stage of life makes the person very short, i.e. causes dwarfism.

(iii) Diabetes mellitus Insulin secreted by pancreas helps to lower the blood glucose level. When it is

secreted in less amount, the body suffers from diabetes. (3)

- (b) The pituitary gland secretes a number of hormones that regulates various functions of the body. It also controls the functioning of the other endocrine glands. Hence, it is called as master gland. Pituitary gland is located just below the hypothalamus at the base of brains. (2)

36. It is desired to obtain an erect image of an object, using concave mirror of focal length of 12 cm.

- (a) What should be the range of distance of an object placed in front of the mirror?
(b) Will the image be smaller or larger than the object? Draw ray diagram to show the formation of image in this case.
(c) Where will the image of this object be, if it is placed 24 cm in front of the mirror? Draw ray diagram for this situation also to justify your answer. Show the positions of pole, principal focus and the center of curvature in the above ray diagrams.

Or

A student wants to project the image of candle flame on the walls of school laboratory by using a lens.

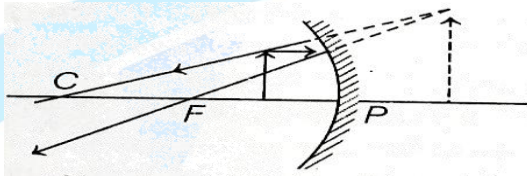
- (a) Which type of lens should he use and why?
(b) At what distance in terms of focal length F of the lens should he place the candle flame, so as to get
(i) a magnified and
(ii) a diminished image respectively, on the wall?
(c) Draw ray diagrams to show the formation of the image in each case.

Sol.- (a) $f = -12 \text{ cm}$

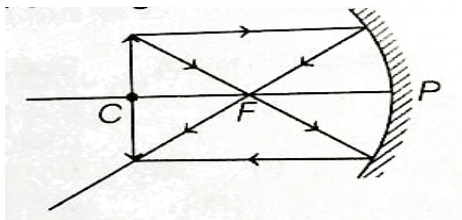
Thus, range to obtain erect image

$$\Rightarrow o < u < 12 \quad (1)$$

(b) Image will be larger than image



(c) Position of image



Here, $f = -12 \text{ m}$, $u = -24 \text{ cm}$ $v = ?$

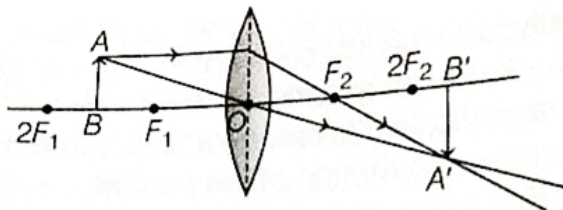
By using mirror formula,

$$\frac{1}{f} = \frac{1}{v} + \frac{1}{u} \Rightarrow \frac{1}{v} = \frac{1}{-12} - \frac{1}{(-24)} \Rightarrow v = -24 \text{ cm} \quad (2)$$

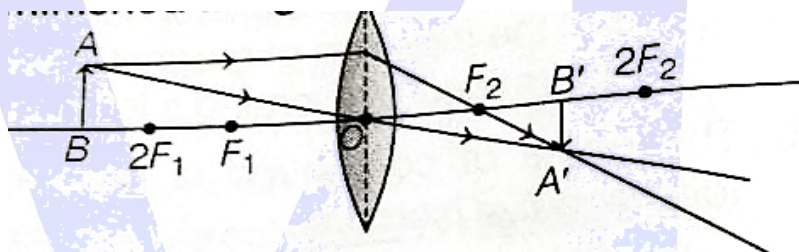
Or

- (a) He should use a convex lens as real images are formed by it.

- (b) (i) For magnified image, he should place the candle flame between focus (F) and centre of curvature ($2F$) of lens.
(ii) To get diminished image, he should place the candle flame beyond centre of curvature ($2F$) of lens.
(c) (i) For magnified image



(ii) For diminished image



(3)

SECTION E

Question No. 37 to 39 are case-based/data-based questions with 2 to 3 short sub-parts. Internal choice is provided in one of these sub-parts.

37. The table given below shows the hits given by the quiz master in a quiz.

S.No	Hints
(i)	Substance 'A' is used as refrigerant and food additive.
(ii)	'A' on reduction gives 'B'.
(iii)	'B' is mainly used to produce ethylene.
(iv)	'B' on reaction with chlorine in the presence of sunlight gives 'C'.
(v)	'C' is a colourless gas with a pungent odour.

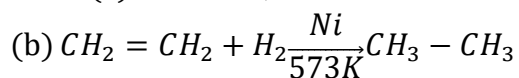
Based on the above hints answer the following questions.

- (a) Name the compounds A and C.
(b) Write chemical equation for the conversion of A to B and B to C.
(c) Write the definition of reduction.

Or

(c) What is the industrial name of 'A'? Give its industrial uses.

Sol.- (a) A-Ethane, C-Chloroethane.

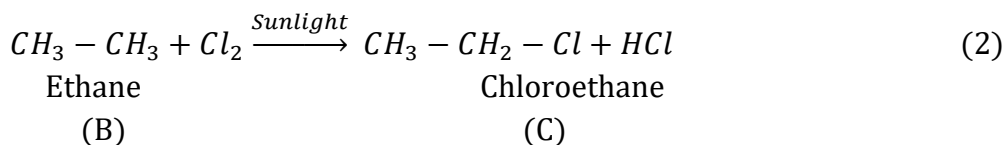


Ethane

(A)

Ethane

(B)



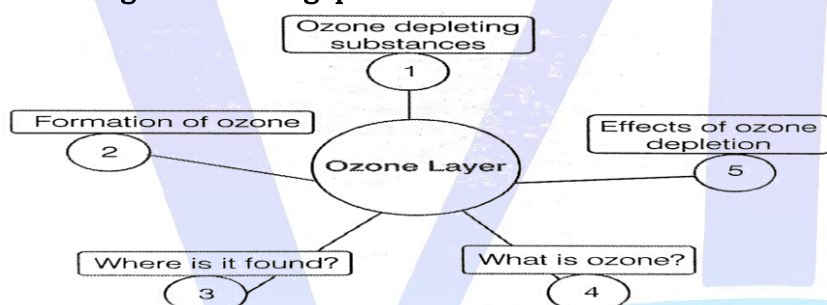
Or

The industrial name of ethyne acetylene.

Use of ethyne are

- (i) It is used in the manufacture of polythene.
 - (ii) It is used as an illuminant.
- (2)

38. To study the ozone layer depletion, Mrs. Sharma, a science teacher drew the given flow chart on the blackboard. After completing this topic, she asked some question from student. Help them by answering the following questions.



(a) What are ozone depleting substances?

(b) Ravi wants to draw ozone layer in a diagram showing different layers of atmosphere, where should he label it?

(c) How is ozone formed?

Or

What could be the effect of ozone depletion?

Sol. (a) Substance that are responsible for depletion of ozone layer or breakdown of ozone molecules are known as ozone depleting substances. (1)

e.g.- CFCs halogens, nitrous oxide, CCl_4 and CH_4 are ozone depleting substances responsible for ozone layer depletion.

(b) Ozone layer is found in the stratosphere around 15-30 km above the earth's surface. (1)

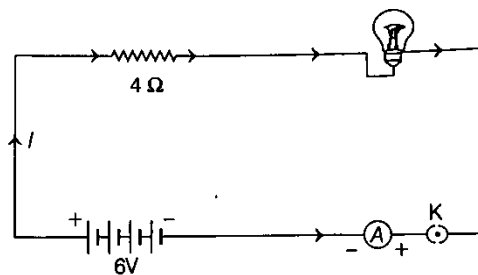
(c) Atomic oxygen is highly reactive. It combines with molecular oxygen under the action of UV radiations to form ozone.



Or

Cancers mutations, effect on eyesight, global warming, weakening of immune system, etc, are some adverse effects of ozone depletion. (2)

39. An electric lamp of resistance 20Ω and a conductor of resistance 4Ω are connected to a 6 V battery as shown in the circuit given below.



Calculate

- the total resistance of the circuit.
- the current through of the circuit.
- the potential difference across the electric lamp and conductor.

Or

- (c) What is the power of a lamp, if it is connected to a 12 V battery and draws a current of 0.5 A ?

Sol.- Given, resistance of lamp (R_1) = 20Ω

Resistance of conductor (R_2) = 4Ω

Potential difference of battery (V) = 6 V

- (a) Total resistance, (1)

$$R = R_1 + R_2 = 20 + 4 = 24\Omega$$

- (b) Current through the circuit

$$I = \frac{V}{R} = \frac{6}{24} = 0.25\text{ A} \quad (1)$$

- (c) Potential difference across electric lamp = IR_1

$$= 0.25 \times 20 = 5\text{ V}$$

$$\text{Potential difference across conductor} = IR_2 = 0.25 \times 4 = 1\text{ V} \quad (2)$$

Or

- (d) Given, $V = 12\text{ V}$ and $I = 0.5\text{ A}$

As power, $p = V \times I$

$$= 12 \times 0.5 = 6\text{ W} \quad (2)$$